Planes, trains, and cars—the United States has traditionally been a nation on the go, highly dependent on efficient and reliable transportation. But as the 21st century approaches, people are finding their commutes by automobile longer and more congested, and often downright dangerous, with nearly 40,000 traffic fatalities each year.[1] In fact, the Federal Highway Administration forecasts that the number of vehicles on the road will rise 50 percent by the year 2005 over the 1988 figures, and the typical commuter's delay will rise from 15 minutes to about 1 hour.[2] And we are finding travelers more dependent on air travel to conduct routine business, creating new financial incentives for the airline industry to maintain the performance of its fleets and keep them running on time.

Many types of advanced technologies, such as electronics and materials, can improve the performance and safety of transportation systems. For example, innovative sensors can be used to prevent car collisions. High-temperature microelectronics can improve the performance, fuel consumption, and lifespan of aircraft by monitoring and controlling critical elements of jet engines, such as temperature, pressure, thrust, and fuel flow. And new material processes can make automobile and airplane parts more durable at lower costs. Ultimately, advanced technology will help improve the reliability of transportation systems, eliminate traffic congestion and delays and—most important—save lives.

Today's market. Automobile and aircraft manufacturers see signs that the transportation industry is beginning to grow after leveling off in the early 1990s. In one example, sales of passenger cars and light trucks in the Unites States totaled 15.06 million units in 1994, up 8.4 percent from 1993.[3] In another, jet aircraft makers are expecting $1 trillion in sales over the next 20 years, owing to growing passenger traffic, aging fleets that need replacement, and a return to profitability of the whole airline industry.[4] Technology is even allowing individuals to plan their own road trips right on their home computers, choosing from several options such as fastest, most scenic, or shortest routes. About 750,000 people purchased travel-planning software last year, and this market is growing rapidly. In 1994, sales reached $30 million, up 250 percent from 1993.[5]

Tomorrow's opportunity. BMDO's R&D in materials and advanced sensors has produced many innovations for ballistic missile defense systems. These innovations have been incorporated into new technologies that can help the transportation industry to improve safety, increase equipment performance, reduce congestion, enhance mobility, and minimize environmental damage. The following section describes seven such examples.

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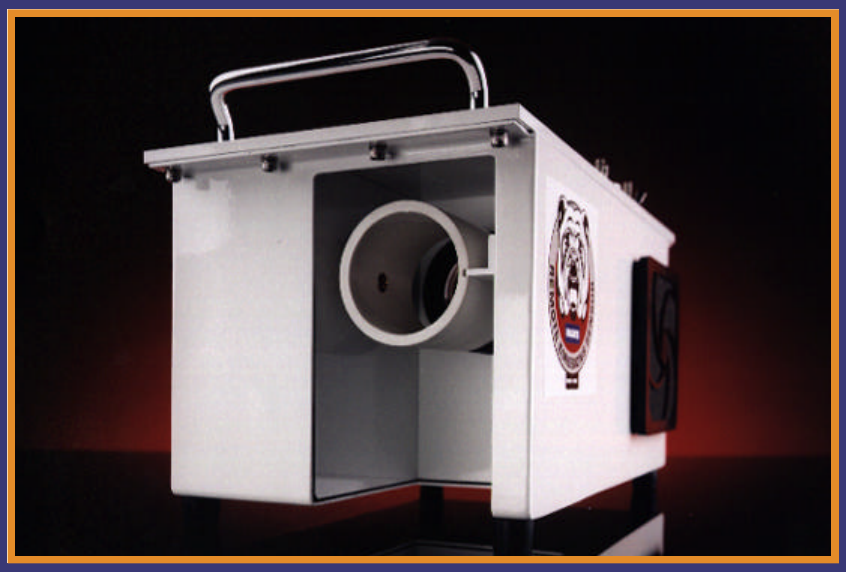
[1] Smart Solutions…S. Taylor; *American City & Country*, September 1994, p. 48.

[2] Smart Cars and Smart Highways…M. Fiseheti; *Photonics Spectra*, November 1994, p. 77.

[3] *Industry Surveys*, Standard and Poor's, April 27, 1995, p. A-96.

[4] Business Bulletin: A Special Background Report on Trends in Industry and Finance…*Wall Street Journal*, June 22, 1995, p. A-1.

[5] Travel Software Offers Info for the Highway…*Wall Street Journal*, May 12, 1995, p. B-11



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